

Comments on Responses to the FCC's Compatibility NOI:

1) Consumer Electronics Group of the EIA

The EIA response launches a full scale attack on scrambling, proposing that the FCC has full power to preclude scrambling. It comes out full force for pushing the whole burden on cable and avoiding any burden for Consumer Electronics. It as much says that there is little point in the FCC defining technical specifications for "Cable Ready" TV's and VCR's because consumer electronics manufacturers will simply not call their products "Cable Ready" and thereby evade the requirements.

Pg 4: "Years of dialogue with the cable industry have consumed substantial resources but generated little meaningful progress in several critical areas. Present trends are ominous ..."

We believe that a substantial amount of progress has been made in understanding what is necessary for TV's and VCR's to be Cable Ready. Unfortunately, that can't be done without incurring costs. The ominous aspect of this is the effort of some in the Consumer Electronics Industry seek to impose large costs upon all cable subscribers through mandated, expensive "in the clear" techniques. This is proposed to avoid more reasonable, limited costs focused on those consumers who wish truly "Cable Ready" products and are willing to pay for them.

Pg 6: "As the Commission makes its own public interest determinations, it should not forget which industry's conduct made this legislation necessary. ... the fundamental cause of the problem that led to Section 17 ..."

The fundamental cause of the problem is the desire on the part of some in the Consumer Electronic industry to make and sell products which have the sales appeal that comes from calling them (or implying that they are) "Cable Ready" or "Cable Compatible" while avoiding the costs necessary to allow these products to work properly when connected to cable. Competitive cost pressures then force all others to make similar products. Since the details of what is "Cable Ready" are almost impossible to explain on the sales room floor, consumers have difficulty making informed choices.

The set-top boxes which cable operators install have superior and more costly tuners and shielding and special circuits to process signals in a manner that protects copyrights. All of this can be cost effectively accomplished and accommodated in Consumer Electronics; but it cannot be done cost free!

Until the Consumer Electronics industry adjusts its practices so that it can sell premium products with higher prices and lower featured products for lower prices, there can be no real solution.

Pg 8: "Regulators should be much quicker to prescribe rules of conduct for parties wielding monopoly power."

EIA's monopoly arguments are nothing more than an attempt to obfuscate the real issues in this proceeding by engaging in the tactic of "red baiting." They also conveniently ignore the fact that four very prominent manufacturers of consumer electronics equipment, Zenith, Pioneer, Panasonic and Philips Broadband (formerly called Magnavox) manufacture converters, descramblers and other hardware widely used by cable television systems.

Pg 13: "Consumer electronics products cannot reasonably be expected to be 'compatible' with cable systems if the characteristics of those systems vary widely and are constantly in flux. ... The intent of the legislation is to address problems with the installed base, as well as new equipment beginning some years into the future."

The fundamental nature of technology is change and growth. It cannot be in the public interest to freeze technology so that one industry does not have to accommodate change.

Pg 14: "Senator Leahy stated '[i]t is more and more evident to me that the main reason for converter boxes is that cable companies can charge for them'"

Converter boxes merely compensate for deficiencies in TV or VCR tuners. As TV and VCR tuners improve, there is less need for converter boxes. In fact, the number of converter boxes purchased each year decreases. Descrambling equipment also provides access to programs which must be protected by scrambling to preserve their copyrights.

- Pg 15: "The primary problem with channelization is that the number of channels delivered by cable systems represents a moving target ... Now there is talk of offering up to 500 channels ..."

Moving targets are a part of life in a technological world. Almost no business is free from the challenge of change. Met head on, change can be made into opportunity. It is pointless to try to stop the advance of technology. If technology is frozen in one industry, it will only move forward in a competing industry.

Can offering 500 channels of choice in ideas and programming be a bad thing? It may require supplementary equipment to gain access to 500 channels, but a subscriber always has the right to stay with the Basic Service Tier and ignore the new opportunities presented in the additional 500 channels.

- Pg 17: "... we use the term 'converter boxes' to include descramblers ..."

Converters and Descramblers are two different pieces of equipment with very different technological content, features, and costs.

- Pg 22: "Picture-in-picture is now incorporated in over 20 percent of all new TVs sold, and this feature is now found in approximately 10 percent of all U.S. households."

This appears to be a high-end feature for the most expensive products with little impact on the average consumer. 10% and even 20% problems are a poor reason to seek mandatory expensive solutions which would burden 80% to 90% of the population. It is much more reasonable to provide optional solutions which can be made available to those who value these features rather than force them on everyone.

- Pg 24: "... some cable companies favor a more expansive definition of 'cable-ready' ... the Cable Act does not require manufacturers to offer 'cable-ready' products, only that they comply with criteria to be established by the Commission if they wish to use that phrase in marketing their products. Expanding the definition of cable-ready would create disincentives for the manufacture of 'cable-ready' products and make the establishment of a definition a meaningless gesture. ..."

This attitude illustrates that the consumer electronics industry believes they can evade the purpose of the statute and escape any obligation to improve compatibility merely by not using the term "cable ready" when marketing their products. This is precisely why the Commission must prohibit the manufacture of products which tune to cable channels unless they meet the definition of cable ready adopted by the Commission.

- Pg 25: "... the Cable Act is drafted in a manner that makes it possible for the Commission to assign much -- or even all -- of the burden for achieving compatibility to either industry. Nonetheless, we feel strongly that the burden must be carried primarily by the cable industry. ... the consumer electronics industry is competitive, while cable service is almost invariably provided on a monopoly basis, making imposition of regulatory burdens much more appropriate ... there is nothing practicable that the consumer electronics industry can do to ease the compatibility problems already facing the 300 million TVs and VCRs currently in use ..."

It is a simple economic fact that the costs of services and features are eventually paid for by consumers. There is no infinite resource which can absorb costs so consumers can get features or services for free. It makes the most sense to design services and features in such a way that those who desire them pay for them and those who have no need for them are not forced to subsidize the others. This is especially the case when the features are high-end, more expensive, and ancillary to the main purpose of the equipment. The average consumer should not be forced to pay extra so that the minority at the high end can enjoy Picture-In-Picture. Those who want PIP should have the option to purchase it and whatever

additional equipment that is necessary to make it work with whatever level of service they desire.

- Pg 28: "The legislation expressly empowers the Commission to forbid scrambling or to decide to what extent it may be used. Our current view is that traps, interdiction, broadband descrambling, and -- further in the future -- a national renewable security standard all provide ways to prevent piracy while avoiding compatibility problems. ... 'Point-of-entry' solutions appear to hold the most promise ..."

Traps, interdiction, broadband descrambling, and a national renewable security standard all are limiting approaches that are expensive as well. They would preclude the majority of subscribers from access to new services so that a minority could enjoy special hardware features which are ancillary to the viewing experience. In addition, they create serious hazards of theft which threaten the copyrights of artists.

- Pg 29: "... new technologies now allow for interdiction to be applied on an 'addressable' basis, thereby allowing for delivery of pay-per-view events and for compliance with 'ant-buy-through' requirements."

Interdiction has always been "addressable". That is not its problem. Interdiction has a wide variety of limitations and is expensive. But not being addressable has never been one of its limitations.

- Pg 31: "... a single national standard for digital transmission of television signals, ... establishment of a national renewable security standard, one that would entail decoding within the consumer electronics equipment ... by way of 'smart cards' or other new technologies."

Digital Technology is at an embryonic stage. Any early attempt at standards would create obsolete rules which would limit services. At some point in the future, when the technology has matured, it may be reasonable to consider standards. But for the present, we must design systems which can accommodate change so consumers can have the fruits of progress with a minimum of burdens.

Standards which apply to cable but not to competitive delivery means would not benefit consumers or the consumer electronics industry. They would simply limit choice.

- Pg 31: "We are decidedly less enthusiastic about proposals to modify 'existing consumer TV equipment designs to make [consumer products] more compatible with the manner in which cable service is provided. ... policy makers have not found it necessary to prescribe the characteristics of consumer electronics ..."

Even if we permanently froze the status quo and offered no new services, TV equipment designs must change to avoid Direct Pick Up, overload distortion, and inadequate channel capacity. Without these modifications of current designs, set-top converters will continue to be necessary if subscribers are to have adequate picture quality in certain situations. No solution is possible which allows current consumer equipment designs to avoid improvement.

- Pg 32: "... some in the cable industry may advocate revival of the 'Multiport' or some similar interface. ... A complete response can be deferred until there is a specific proposal ... but it is timely to identify several concerns about this ... (EIA-563) failed because of lack of support from the cable industry, not the consumer electronics industry."

This statement would imply that 'Multiport' died and no longer exists. This is not true. Bang & Olufsen continues to sell products which include the ANSI / EIA 563 Decoder Interface Connector and cable operators continue to supply descramblers which interface with it. Unfortunately, this is in very small numbers. Wider participation would be beneficial to subscribers. In Europe, huge numbers of TV's are sold with this same mechanical plug and similar, but not identical, electrical connections.

There is a standard for this interface which has been agree-to between the engineers of the two industries. This interface works and works well. It can be extended in a backwards compatible manner to be more cost-effective and efficient. But there is no logical reason to abandon it except to avoid modest cost increments in consumer electronics equipment.

Pg 33: "... any decoder interface (whether the original Multiport or some updated variation of it) adds some costs to the price of every TV or VCR, whether or not the consumer intends to connect those products to cable. These costs may be difficult to recover ... Multiport is no longer compatible with the full panoply of scrambling systems used by cable operators today and provides no basis for handling the digital signals of tomorrow.

an addressability system, billing interface, or even protective housing. There are many questions and challenges that must be met before it can be field tested. Questions about cost and limits in flexibility are daunting. It is not compatible with digital television or HDTV.

Pg 36: "... rate regulation ... to eliminate artificial economic incentives for cable operators to require the use of converter boxes ... cable home wiring proceeding ... can serve as the basis for a ... scheme that ends the cable companies' monopoly ..."

Pg 39: "... we hope the Commission's efforts to 'assure compatibility' ... will cause use of converter boxes to be eliminated."

Converter boxes can only be eliminated when new tuners in TV's and VCR's are produced without the deficiencies which require converter boxes and all existing TV and VCR tuners used with cable are retired. Since many current tuners in production still have deficiencies requiring converters, their elimination is not to be expected soon. Fortunately, some manufacturers are producing better tuners and the number of required converters is diminishing.

Pg 40: "It may be necessary to develop technical standards for converter boxes, both those provided by cable companies and those provided competitively."

This is certainly necessary if the problems of "Cable Ready" are to be avoided for this category of mandated equipment. We believe that the full technical specification for "Cable Ready" should also apply to this equipment.

Pg 41: "The future cable developments which hold the greatest potential for adverse effects on compatibility of consumer electronics equipment are expansion of channel capacity via use of increasingly higher frequencies for analog transmission and introduction of digital transmission and compression techniques."

Expanded channel capacity and digital compression are the mechanisms for increased choice in programming for subscribers. Subscribers demand more choice and new exciting services such as Near Video On Demand. This type of freeze on technology is a disservice to the public and raises First Amendment issues as well.

Pg 42: "... we believe that the Commission should exercise its power to forbid scrambling, unless and until the cable industry agrees to adopt a single standard for cable-delivered digital compression, transmission, and scrambling -- or until one is prescribed by the Commission."

Pg 43: "... the Commission should consider prescribing a moratorium on the use of digital compression in cable systems. Such an action could prevent the development of new generation of compatibility problems ..."

The EIA's call for technology freeze on digital compression assumes subscriber demands for more choice and greater access to ideas, information and programming can be put on hold. It also assumes that compression technology has reached a mature state with no further changes to be expected. Both assumptions are wrong. Subscribers have shown a surprising appetite for more choice. Digital video technology is making advances at an astounding rate. Subscribers' hunger for more video must be satisfied now with the best currently available digital technology implemented in a manner which allows the digital hardware to be replaced in step with the advances in compression.

Pg 44: "We feel strongly that features such as program guides should be included in competitive consumer electronics equipment and not reserved to the monopoly domain of the cable service provider."

Cable electronic program guides are a service, not a hardware feature. They will become increasingly important as the number of programs available increases. They are a service just as print guides are a service. The electronic version must have the freedom to experiment with format, layout, and methods of providing the information to accommodate changing styles and subscriber needs. This cannot be done if it is frozen in hardware whose primary objective is low cost equipment.

If the equipment cost is separated from the delivery costs, a suboptimum result is likely. For example, less memory in the hardware lowers hardware costs but increases the need for bandwidth to continually supply the same information over and over again. When the hardware and

the programing are part of a system, overall cost and usability of the service can be optimized.

No one knows the optimum format for providing program guide information. A number of entities are competing with widely different proposed approaches. Apple, MicroSoft, Intel, AT&T, the traditional cable suppliers, and a wide range of entrepreneurs are striving for the best solution. See the Discovery Communications filing for one exciting example.

Pg 44: "It is therefore important that data streams that can be used to support consumer electronics features be available at the consumers' equipment and not stripped off at the cable head-end or the converter box."

This statement requires more definition. Cable is certainly committed to providing Captioning for the Hearing impaired. Long before there was a Captioning Decoder Act, many cable systems were providing set-top captioning decoders to hearing impaired subscribers. Most cable programmers include a significant portion of Captioning programming. This is not a problem. Many elements of the Line 21 Extended Data Service are of benefit to cable subscribers and will likely be included in cable programming as well. In fact, services like this have been discussed in the EIA / NCTA Joint Engineering Committee.

2) National Electronics Service Dealers Association, NESDA

This organization represents firms that sell and service consumer electronics products.

Pg 2: "... the 11,000 local cable systems are free to use different types of signal transmission, decoding, and in-home devices. Cable systems are not standardized with respect to each other, or with respect to consumer electronics equipment."

Consumer products are not all "standardized with respect to each other." But this does not make them useless. Universal standardization is not only not necessary, it limits innovation and experimentation with new products and services.

Cable systems all provide standard NTSC signals for display on NTSC television receivers. There would be no cable business if it did not provide signals which are usable on existing subscriber-owned equipment. The "non-standard" aspects of cable have to do with offering services that go beyond the capabilities of existing equipment and with signal protection schemes. These signal protection schemes are not the domain of consumer electronics. They must be under the control of those who are responsible for protecting the integrity of copyrights. In that way they can be replaced if they are compromised without obsoleting equipment purchased by the consumer.

Pg 4: "... the FCC should prescribe national standards to assure cable compatibility with the next generation of digital television technology -- ... HDTV and digital signal compression ... that would allow cable subscribers to plug in and use products that they buy competitively at retail."

In its proceedings on HDTV, the FCC has specifically said that it will not provide technical regulation of HDTV on cable. Nonetheless, there is no known separate development program for an HDTV system for cable. The cable industry has supported the FCC and the Advanced Television

environment. Other proponents have similar capacity enhancing suggestions. If this is technically feasible, it will be in the best interests of consumers and consumer electronics manufacturers to include a mode of operation that is compatible with double data rates in products. Otherwise a translator of some sort will be required to convert the double data rate signal to single rate.

It should be noted that the ghost canceller (time domain equalizer) required for cable is likely to be much simpler and less expensive than what is needed for broadcast reception. This may someday result in a more expensive "Broadcast Ready" product intended for more than just cable usage.

Pg 5: "NESDA recommends ... a national standard for renewable security ... a replaceable module, disc, or 'smart card.'"

The "replaceable module" desired by NESDA is the ANSI / EIA 563 Decoder Interface module.

3) Electronics Technicians Association, Int'l

The Electronics Technicians meet the customer on a daily basis and have a good idea of what problems are actually encountered in the home. Their comments are supportive of our position that this thing is way out of proportion!

Pg 3: "Present-day cable subscribers on the majority of cable systems do not have a problem with compatibility. Subscribers on the much smaller number of large systems have compatibility problems in varying degrees."

Pg 6: "The entire problem of compatibility may be somewhat blown out of proportion. We estimate no more than 5% of today's subscribers experience the problem."

This agrees with our experience.

Pg 7: "Imagine a BASIC trap, a TIER 1 trap, a TIER 2 trap, an HBO trap, a CINEMAX trap, etc., etc., while allowing a single subscriber to buy only 'The Movie Channel!' There is a word for that, and it is insanity! On the other hand, an addressable system which is capable of sorting out a single service would be giving its subs more choice by doing that, and such a single service request could be practical."

Those who deal most closely with consumers and with their hardware come to the same conclusions in both cable and consumer industries.

4) Mitsubishi Electronics America Inc., MELA

Mitsubishi calls for services to be regulated, but not TV and VCR features. They also call for a moratorium on the introduction of all new cable services!

Pg 3: " the FIA/NCTA Joint Engineering Committee developed a standardized channel plan called IS-6. Most TV sets

Pg 6: "... features should not be regulated, but services should. ... This will be the only way to ensure open markets and compatibility for all hardware oriented features."

The American marketplace wants programming and services. Hardware is just a means to the end, not an end in itself. While hardware is the business of consumer electronics, it cannot become the tail that

- Pg 8: "The commission should consider long term solutions as the most important aspect of this rule making process."
Pg 9: "An immediate moratorium should be imposed on the introduction of all new, non-regulated services until rules and regulations are in place in these ... areas. While asking for a moratorium on the implementation of new services such as compressed-digital 525 may sound anti-progress, in fact the alternative is mass confusion ..."

Technology cannot be frozen. Services which expand subscriber choice and access to ideas, information and programming should not be frozen.

- Pg 10: "The methods of signal security that do interfere with features ... include any security systems based on the use of set-top-decoders or set-back-decoders."

Set back decoders provide transparent operation of features and set-top units can be implemented in ways that do not interfere.

- Pg 12: "... performance minimums and capabilities should be required from cable systems ... a designation of "Consumer-Compatible" or "TV-Ready" should be associated with them."

This is a bizarre suggestion. Any service which is not usable by consumers with equipment they own would not be successful. If consumers rejected cable service because they thought it was not compatible, cable wouldn't have reached its current penetration. Obviously, subscribers find cable service of value.

5) Matsushita Electric Corp. of America, MECA

This manufacturer emphasizes hardware and hardware features at the expense of programming. MECA calls for a national renewable standard.

- Pg 8: "... selecting arbitrary compression and transmission systems that will vary throughout the country -- that best exemplify the [sic] congressional concern with the arbitrary nature of local monopoly."

Compression and transmission systems are selected from technology available at the time of construction or upgrade of cable systems to best serve the needs of subscribers as determined by market demands and as represented by franchise authorities. There is nothing arbitrarily about the process. The franchising and franchise renewal processes are well defined.

- Pg 12: "... only way to give full function ... deliver signals ... so that all purchased signals are simultaneously available in a standardized format. Any descrambling ... not capable of being performed by today's TVs and VCRs must be done at point of entry ..."

We are not aware of any descrambling that can be performed by today's TV's and VCR's.

We believe that scrambling can be implemented in ways that allow full use of the functionalities specified in the Cable Act.

- Pg 15: "... there is no reason to encourage, or even permit, a profusion of divergent and conflicting non-broadcast television services. ... The Commission did not allow such Balkanization to occur in terrestrial broadcast television, nor should it allow it in non-broadcast television. In regulating cable encryption, the Commission should not allow departures from NTSC until standards for compression and transmission have been adopted."

There is every reason to encourage a broad range of services and choices for subscribers. That is the concept behind and the promise of cable. Seeking to limit choice is to miss the point of it all

NTSC is the signal provided for display. Nothing else has ever been proposed.

- Pg 16: "... the Commission is supervising the introduction of HDTV service to terrestrial broadcasts. There is no reason for future cable industry implementation of HDTV to be incompatible."

The HDTV signal delivered over cable will be designed for display on FCC standardized receivers. It may be possible to deliver two HDTV signals in 6 MHz and to also avoid the need for expensive ghost cancelling in the cable application. If those features are designed into the receiver, it will be compatible. Precluding cable from taking advantage of its well controlled signal environment to provide double capacity HDTV is not in the public interest.

Re 47: "The Commission should require that standard frequency picture coding compression not be used."

There are more cost-effective ways of immediately providing retroactive compatibility for exiting TV's and VCR's as well as inexpensive new TV's and VCR's.

Pg 5: "The cable industry has exempted itself from any ... standards. Consequently, individual cable systems can adopt unique channelizing and scrambling schemes that are incompatible with consumer's TVs and VCRs. ... consistent standards for signal transmission, channelization, signal levels, scrambling and signal usage must be established and adopted by the entire cable industry before the issue of a true cable-ready product can be resolved."

The cable industry cannot exempt itself from standards. Where there are standards, they apply, otherwise they don't exist.

"Standard" TV's and VCR's use 6 MHz Amplitude Modulated signals. That is exactly what cable provides to TV's and VCR's used on cable. Essentially all subscribers have access to signals provided in broadband form. When scrambling is used, the scrambled channels must be decoded either with a set back modular descrambler or in a set-top unit which can include a bypass switch simultaneously making the unscrambled signals available.

The same cannot be said of the proposed Direct TV DBS service. There will be no simultaneously available unscrambled cluster of channels. All signals will have to be decoded and presented one channel at a time for viewing or recording. The subscriber who wishes to watch one while recording another will need to receivers and decompressors and two subscriptions. If he wishes a different program in another room, yet another receiver and decompressor will be required. This hardware is much more expensive than cable set-tops. A set-back modular solution is not possible because the signal is wider than the 6 MHz TV channel. The alternative is special, non-standard TV receivers and VCR's or set tops for each.

Pg 5: "... if the cable signal transmission standard is allowed to change freely as it is today, the presence of a multiport or IF loop may not act to prevent the requirement for added decoder or converter boxes ..."

The proposed services for cable are all compatible with a multiport or IF output. An IF loop is not contemplated. With baseband inputs to the TV or VCR, an IF return is not needed.

Pg 6: "... viable technology is not available within this limited analog time frame to develop and establish an analog-only based national renewable security system ..."

We believe that no time frame would allow an analog based national renewable security system. We are nervous of a digital standard security system unless there is a well defined and financed alternative for dealing with a breach.

7) Sony Corporation of America

Sony proposes a wired link that it is less costly for them (but not for cable or the consumer) than a Decoder Interface Connector. It fails to solve a number of important problems that the Decoder Interface Connector addresses. It still requires the purchase of a new TV or VCR! It doesn't help existing receivers. It requires that the set-top have its own tuner and remote control. This costs money, consumes power, reduces reliability, and tends to distort the signal. The ultimate flexibility that comes from baseband inputs and outputs from the TV or VCR are lost. Sony calls for "clear channel" descrambling; i.e. Broadband Descrambling and for digital standards.

Pg 8: "VCR time shifting capability can be partially restored by providing all unscrambled channels directly to the TV and VCR ... bypassing the cable box."

This is an approach we support as cost effective and easy to use. Its cost benefit ratio is very favorable.

Pg 9: "... given the well-documented difficulty that consumers have in programming their VCRs, requiring them to correctly program two devices ... is not an attractive solution."

The gating factor is the ability to program timed devices. The subscriber who can program his VCR can use the same skills to program a set-top descrambling converter to accomplish this result. For the subscriber who cannot program his VCR, the point is moot.

Even in the case of subscribers who can't program their VCR's, there is at least one solution. The "VCR Plus" product controls channel changing of set-top converters and the recording function of VCR's. Once initialized with the channel line up and the correct time, the subscriber enters a code obtained from a printed guide in the local newspaper, or nationally from TV Guide. The VCR Plus unit emits infra red signals that control the appropriate hardware. Many cable operators set up the VCR Plus unit with the system's channel line up as a service. This makes consecutive recording of different channels easy.

Pg 10: "Most cable remote controls do not have the ability to address one specific cable box in a multiple cable box setup."

While this is true of existing units, there is no technical reason why additional units can't be obtained with a second infra red control set. The second units can be used with the existing units to easily solve this inconvenience.

The manner in which the second set-top unit is used is such that remote control is not important. The second unit will be programmed to record a channel at a certain time and then turn off. It is the primary unit which does most of the channel changing and benefits from the use of remote controls. If the second unit had no remote control, little convenience and no functionality would be lost.

Pg 14: "... manufacturers should develop a standard wired control link to cable boxes."

Pg 17: "The communication 'language' could be the existing basic cable IR commands, transmitted by wire, instead of by IR signal ... would allow two or more cable boxes to be controlled individually by TVs and VCR. Although wired cable box control has not yet been developed, it could be designed relatively quickly, with cooperation from both the CE and cable industry ..."

The wired control link has the advantage that it would allow consumer electronics products to control the channel being tuned by a converter or descrambling converter. This would facilitate the features discussed in the Cable Act. But this is not the only way to accomplish this goal.

The disadvantages of the wired control link are: 1) new TV's, VCR's, and converter/descramblers are required. 2) The converter/descrambler continues to have a tuner with its added expense, power consumption, and contribution of noise and distortion, 3) the protocol for communicating between the units does not exist and may or may not be easily agreed to. 4) it does not provide a baseband video input to the TV or VCR which in the Decoder Interface Connector allows for excellent on screen displays and much better pictures from digitally compressed video.

While the cost of the wired control link would be less for the consumer electronics manufacturer, the costs for the consumer and the cable operator are greater and the picture quality poorer than with the existing ANSI / EIA 563 Decoder Interface Connector.

Pg 18: "Decoder interfaces have been tried in the past without success. ... require that restrictions be placed on cable systems' flexibility. ... advent of digital transmission could render ... obsolete"

Pg 18: "... several hundred thousand sets were made ... few cable systems offered the descramblers that were necessary to operate Multiport. ... some scrambling techniques were developed that were incompatible with Multiport. ... the Multiport connector was abandoned."

This is simply not true. Decoder Interfaces work and work well and have yielded substantial subscriber satisfaction. The principal dissatisfaction has been its lack on VCR's. The current standard can be used with all known scrambling schemes and digital video compression

by connecting the cable directly to the unit and using its baseband video output to feed the TV or VCR. A backwards compatible upgrade with an IF output for the TV or VCR along with specifications on the characteristics of the tuner and associated circuits will make it fully functional with digital signals.

Pg 21: "... nationwide consensus on standards would enable consumer electronics manufacturers to build digital 'tuners,' decompressors, descrambling and addressability capabilities directly into TVs and VCRs ... it is probably impractical to reach a consensus on national standards for scrambling in the current analog environment."

Consumer manufacturers hunger for building in the digital and encryption circuits. This is curious since they claim the Decoder Interface Connector is too expensive! It is likely they do not appreciate the liabilities associated with making the decryption circuits. If these circuits are compromised, not only will consumers be angry, but the equipment manufacturers may also face potential legal exposure.

From a business perspective, a standardized decoder and a standardized decompressor adds cost but no points of differentiation from competitors. If there were points of differentiation, the circuits couldn't be standard! It is hard to understand why these manufacturers are so anxious to take on costs and liabilities which do not give them advantages over each other on the sales floor.

8) Multiplex Technology

Multiplex would just like to sell a lot of modulators for high end installations such as for home theaters. Multiplex has no involvement with the vast majority of cable subscribers. Even in those expensive situations, Multiplex understands that full compatibility is not likely. It is even less likely for the average subscriber.

9) Zenith Electronics Corporation

This proposal departs sharply from the other Consumer Electronics filings. While cable may disagree with some of the details, at least Zenith recognizes that "in the clear" approaches don't fit the needs of the cable subscriber and the cable business. This is the only Consumer Electronics proposal that begins to look for a solution which is practical and shared rather than merely proposing that the burden caused by the consumer industry's desire to sell "cable ready" products be carried only by cable!

Pg 4: "Broadband descrambling would reduce the number of security options available to the cable operator, and would not block the audio on scrambled channels, a condition unacceptable to many local authorities."

Pg 5: "While there now appears to be general agreement that the 'Multiport' as presently defined will not be adequate for a number of reasons, an updated interface could be readily developed. ... would substantially increase the cost of those products and, if required for all TVs and VCRs, would place the burden of higher prices on all consumers, whether or not they subscribe to the cable services ..."

Reading the filings from the cable industry brings to question the assertion that there is general agreement that Multiport won't be adequate. While most of the respondents from cable believe that the current standard is viable, there is reason for backwards compatible improvements including an IF output connection from the TV or VCR.

We believe that premium products should command higher prices, but this is impossible in an environment where inferior products are indistinguishable on the sales room floor. When TV's and VCR's are all connected to a single channel output from a laser disk player or a limited number of off-air-channels, it is not possible to tell which ones have inferior tuners. The only way to prevent unscrupulous competitors from producing inferior products and forcing a competitive response is to preclude the production of inferior products.

Pg 6: "Compromise Solution ... 1. Establish a new 'cable-ready' specification ... incorporating an ... interface port ... and a microprocessor communications link between set-back box and the consumer equipment. 2. ... design to this 'cable-ready' criteria in at least one ... model in each color TV screen size ... 25-inch and over. ... 3. Require cable operators make the appropriate interface decoders available ... and offer those subscribers a reduction in their monthly rate."

We find most of this proposal encouraging and a helpful contribution. It must be taken further in order to accomplish the

compatibility goals established by Congress.

16) InterMedia Partners

InterMedia Partners points out that there are priorities in performance of consumer electronics products. First they should not cause harm to others' over-the-air use of spectrum, then they should not interfere with others' cable reception, finally, they should provide good reception to the subscriber who purchased the product. InterMedia Partners describes set-top switcher boxes which can be used to improve compatibility and ease of use.

The comment on Interdiction being compatible with HDTV may be incorrect if higher data rate transmission is practical on cable and not over-the-air. In that case, cable may carry two HDTV transmissions in one 6 MHz slot. Interdiction would block both and thus be incompatible.

Detailed and fairly complete technical specifications for products to be "cable ready" are suggested at the end of this document.

43b Media General 24th of February

22) Discovery Communications

Discovery Communications is developing a technology and service for improved ease of use of high capacity cable TV. Discovery is concerned that regulations might be imposed which would preclude or severely burden this important new service.

23) United States Telephone Association, USTA

The USTA filing argues for universal compatibility and a vastly expanded advisory committee to debate the issues. This would clearly preclude agreement in the time Congress allowed. USTA misunderstands the meaning of "dual cable system". It interprets that to mean multiple cable system companies delivering service to the same home.

- Pg 2: "The Commission should undertake to inventory the emerging means for delivering video programming, and should establish a target of universal compatibility, ... no participant in the video programming provision or delivery markets should be handicapped because of advantages that might emerge from a rule in which the Commission did not seek universal compatibility."

Universal compatibility is an all but impossible target. Technologies in the various disciplines are advancing so fast, it is not possible to freeze them and force them to be universally compatible. The best we can hope for is some improvement in the situation and sensitivity to these issues in the future.

- Pg 4: "... there is no short term 'quick fix' solution. If fiber-based digital systems expand ... there will no doubt be a gradual shift in the hardware used by video programming providers and by consumers. ... There will not be a flash-cut to a new generation of converters and receivers."

"Quick fix" solutions are likely to cause more problems than they solve as well as to limit future options.

- Pg 4: "Solving the problem of equipment compatibility involves a tradeoff between convenience and cost."

This is a fundamental point made in the legislations. We agree.

- Pg 6: "the Commission asks whether it should take action here to accommodate dual cable systems. ... allow the connection within the home of as many cable systems as a consumer elects to subscribe to. The consumer should be able to buy ... devices that allow switching ... among multiple cable systems ..."

There is a misunderstanding here. Dual cable systems have two cables owned by the same operator. This is not a case of multiple cable suppliers.

24) National Association of Telecommunications Officers and Advisors, The National League of Cities, The United States Conference of Mayors, and the National Association of Counties

More arguments for expanding the advisory committee are presented. It is argued that cable should be made compatible with laser disk players. This must be an error since the issue does not make sense. Laser disks are irrelevant to the topic. The argument is made that only a few steal cable and the majority of honest cable subscribers should not be burdened because of the minority. This does not correlate with the facts. Theft of service is a serious problem. It is suggested that rather than scramble, cable should monitor what is received and charge accordingly. This has serious privacy issues and would also not protect artists' copy rights.

- Pg 6: "The vast majority of cable subscribers are law-abiding; they should not have to rent converter boxes to unscramble a signal if it is feasible for a cable operator to use alternative means to protect against theft of service by a few bad actors. ... feasible ways to detect theft of service, such as monitoring where cable signals are received. To the extent such methods are feasible, cable operators should be prohibited from scrambling or otherwise securing signals."

The NCTA data on signal theft is in direct contradiction to these assertions. Taken to their extreme, this argument would have us connect every one to every service and then just ask people to send in money for

what they watched. If we lived in such a world, real estate taxes could be determined by home owners who would just send in what is fair!

Pg 8: "A television should become more like a personal computer, which consumers may modify to meet their changing needs by adding on equipment ... or modifying current capabilities ..."

The consumer electronics industry resists calls for modular construction and analogies to the computer business. For the most part their concerns are valid. Connectors add cost and detract from reliability. A massive amount of standardization would be required for this to work. Nonetheless, some move to modularity may be helpful.

25) Ameritech Operating Companies

Ameritech cautions against regulations which might hamper video dialtone and calls for wide involvement in the Cable Consumer Electronics Advisory Group.

Pg 3: "... the Commission should not dictate a particular technology. No technology can offer total security from pilferage, and each carries different investment and maintenance costs"

This certainly agrees with our experience.

Pg 4: "... the Commission's ... rules should be designed to maximize the availability of new services."

A service provider has a different outlook on whether new services are a "good" or an "evil". We agree with Ameritech that choice and new services are important for growth.

26) BellSouth Telecommunications Inc.

BellSouth calls for typical phone company procedures in the network and for including them in the compatibility deliberations.

Pg 5: "... disclosure of relevant network service information must take place twelve months prior to the introduction of a new network service or interface ..."

This would stifle the experimentation in new services and limit all participation to giant corporations. Only they could afford the risks required. The small business person or entrepreneur could not survive in such an environment.

27) New York City Dept. of Telecomm. and Energy

While New York City wishes there were alternatives, it realizes that scrambling is state-of-the-art, and important and necessary for the control of theft of service. The New York cable systems are required to report every two years on the state of technology in this area. New York City advises consumers to be careful of their consumer electronics purchases lest they waste money.

Pg 4: "... the City determined that: The use of converter boxes to descramble signals represents state-of-the-art technology ... It also represents an important and necessary means to combat extensive theft of cable service ..."

The City of New York held extensive hearings on this subject and reached the conclusions that scrambling is the state-of-the art method of signal protection and is necessary to combat theft. While the cable system and the City have their differences on a variety of issues, they have come to the same conclusion on this one.

28) Village of Schaumburg Illinois

Schaumburg points out that its franchise, like nearly all franchise agreements, is non-exclusive. The 1992 Cable Act requirements have forced a channel realignment which subscribers find upsetting. Since many "cable ready" VCR's only tune to 30 channels, a converter will be needed

for access to higher numbered channels. Schaumburg comments about the future of 500 channels but mistakenly thinks it is the consumer electronics industry that will cause it to happen.

Pg 1: "The village of Schaumburg has a non-exclusive franchise agreement with TCI, Inc. ..."

Nearly all franchise agreements with cable systems are non-exclusive. Anyone who believes they can do better and can demonstrate competence is able to apply for a franchise. Multiple franchises are not common because of the massive investment and high operating costs involved with cable.

Pg 1: "... Schaumburg received a notice ... that channels were being realigned ... Prior to ... realignment ... The Basic Service tier included 42 channels ... Expanded Basic included six additional ... realignment ... changed the Basic service tier to include 12 broadcast ... and public and government access channels. Expanded Basic service will include the channels previously offered plus the 30 channels earlier available through Basic service. ... the cost of Basic service is going down and the fee for Expanded Basic service is going up, so the total ... will not change."

Pg 2: "... to cost-effectively offer this low cost entry level service, all network channels and public and government access channels must be grouped on the lower numbered channels. 'Expanded Basic channels' and premium channels will now be located on the higher numbered channels. ... this ... was necessary to use one 'trap' to block out anything over the Basic level of service. ... subscribers are upset by this channel realignment because the technology of their ... VCRs does not record higher numbered channels. In fact, most VCRs won't record channels over channel 33.

APPENDIX C

Origins Of The "Cable Ready" TV Concept

Appendix C: Origins of the Cable Ready TV Concept

The incompatibility problem is a natural consequence of the rapid advance of technology in two separate industries. Advances in cable technology have made it possible to expand cable service and to offer new services. Cable subscribers have shown their approval by purchasing these services. Advances in electronics manufacturing technology have made it possible to add new features to TV's and VCR's. These advances in the two industries have taken place with little coordination.

When technology advances, it is first introduced in a manner that is less than convenient. As the technology matures, convenience is improved. For example, the original automobiles had hand-crank starters and "manual" transmissions. While the automobile was a major step forward in transportation, it had these "user interface" inconveniences. As technology advanced, the electric starter and the automatic transmission became a part of nearly every vehicle sold. But this required the technology to mature. Likewise, the original phonograph players required a wind-up spring and a manual loading of each record. This was another "consumer interface" inconvenience. Yet it was an amazing product at its introduction, a "talking machine". That was followed first by the electric motor drive and then by the automatic changer. Now we have microcomputer controlled Compact Disk players that are fully automatic.

Similar events govern the cable interface with consumer electronics. The technological options offered by each industry are confusing to the consumer and not well integrated. As the technology progresses, it can be expected that the interface will improve dramatically. The microcomputer and the On Screen Display, OSD, will help tremendously. The contribution of the microcomputer will be the managing of all of the options and the automatic control of them based on the desires simply expressed by the consumer. Electronic Program Guides delivering data to a microcomputer will allow automatic control of VCR functions without all of the complicated button pushing, switches, and on screen menus required today. The clock will be automatically set. There will be no more flashing "12:00". When the built-in microcomputer is told by the subscriber whether a program is to be recorded or just watched, its program guide data tells it when. It determines what must be done to rout the signal to all the correct components to achieve the subscriber's wish. This is becoming possible now. In just a few years, it will be common place. The technology must be allowed to run its course and the market place allowed to signal its desires without the chilling impact of excessive regulation. See the Discovery Communications filing for just one approach.

The cable / consumer electronics compatibility problem had its origins when the consumer electronics industry discovered that microcomputer controlled varactor diode tuners could be made to tune cable channels at no extra cost. A couple of decades ago, TV's had mechanically switched tuners. This was the biggest source of failure in these products. Long before the rest of the TV failed, the tuner's switches became dirty or wore out. The mechanical tuner also made remote control difficult. A motor was required to turn the tuner and change channels. When the varactor diode tuner was invented, channels could be tuned by applying a voltage to the tuning diode. The first tuners of this type had a row of rotary dials which adjusted potentiometers. A potentiometer is a device which determines the voltage which is applied to the tuning diode. This was a major improvement over the mechanical tuner, but it still had moving parts, electrical contacts, and tended to drift with temperature and age. The number of channels which could be conveniently tuned was limited by the number of potentiometers installed. The first of these electronic tuners only tuned the broadcast channels.. The next step was to introduce a microcomputer along with its ability to access memory. The memory stored the data which determined the voltage needed to control the tuning of the diode. This approach offered an all-electronic tuner with no moving parts that was easy to remote control. Electronic tuners are now universally used in TVs and VCRs because of their superior performance and increased reliability. Initially, the electronics added about \$100 to the cost of the TV. While the TV was

much more reliable and easier to use, it did not provide access to any more services than did the mechanically tuned TV's. Sales resistance was experienced.

It was then discovered that there was excess memory available in the microcomputer. There was enough memory to add the data necessary to tune some cable channels. By simply programming the computer's memory to tune these channels and adding a cable connector to the back of the TV, it became "Cable Ready" at essentially no additional cost. Now the retail salesman could offer something the older TV's did not have, i.e. the ability to tune some cable channels. As cable channel capacity increased, microcomputers with more memory were required. Some small additional expense was required. But this was on the order of a fraction of one percent more cost than a TV that didn't tune the cable channels. Retailers led consumers to believe the \$100 cost increment over a mechanically tuned TV was because the new TV was "Cable Ready". In truth, the cost increment was due to the use of advanced microcomputer controlled varactor tuners with remote control. The "Cable Ready" increment was a couple of dollars at most. It was easier to sell access to a new service than to sell the feature of electronic tuning.

Unfortunately, this approach ignored the original reason cable TV converters were introduced. Originally, TV tuners had poor internal shielding and were not designed to operate in an environment where all channels were occupied. When connected to cable, they suffered from Direct Pick Up, DPU, interference and distortions introduced when the tuner was overloaded with all the channels carried on the cable system. The solution was a superior tuner in a well shielded box on top of the TV with just one channel out. The output channel was selected to be one of the local channels not used, such as channel 3 or channel 4. To this day, many TV's and VCR's still exhibit inadequate performance when faced with a strong off-of-the air signal or a fully loaded spectrum on cable. While they tune cable channels, they are still not truly "Cable Ready".

As cable technology allowed expanded bandwidth and subscribers indicated their approval by subscribing to these channels, problems arose with existing "Cable Ready" TV's and VCR's. A set top converter was required to access the expanded channels that the older "Cable Ready" TV's or VCR's couldn't tune. Currently available Cable Ready TV's and VCR's tune 125 cable channels. The highest channel resides at 800 MHz, which is also the top of the UHF band. Some of the consumer electronics filings complain that cable TV is a moving target with ever increasing upper frequencies. These manufacturers could have anticipated the advance to higher frequencies and been there first. Their own research could have predicted that these higher frequencies would be technically possible. Since the UHF band extends to channel 69 [800 to 806 MHz], the very first "Cable Ready" TV could have tuned that high into the cable band (125 channels) without requiring a higher tuner frequency capacity than needed for broadcast UHF. Literally pennies more cost would have been incurred. The failure of the consumer electronics industry to provide tuning range that tracked the advance of the cable industry is hard to justify. It wasn't until January of 1992 that cable channels exceeded the upper end of the current UHF band. TV's in their broadcast mode tuned that high since the UHF tuning act! In fact, they tuned higher since the UHF band originally ended at channel 83 [884 - 890 MHz, which would have covered 139 cable channels] rather than the current channel 69. Even in the case of cable's move to 1 GHz [1,000 MHz, just slightly above broadcast channel 83] capacity, this was predicted by Time Warner Cable participants in the Electronic Industries Association, EIA, National Cable Television Association, NCTA, Joint Engineering Committee, JEC. In fact a representative of Time Warner Cable (then American Television and Communications, ATC), chaired the JEC for seven years and indicated cable's advance to these higher frequencies to the consumer electronics engineers several years in advance of the launch of the first 1 GHz cable system.